

WHAT IS CLAIMED IS:

1. A resonant circuit comprising:
  - a substrate having a planar surface;
  - at least one resonator formed from a high temperature superconducting material
- 5 formed on the substrate, the resonator having one or more turns, when combined, turn through greater than 540°, the resonator turns including at least one left hand turn and one right hand turn.
2. The resonant circuit of claim 1, wherein the at least one high temperature superconducting resonator is formed using a thallium-based superconductor.
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3. The resonant circuit of claim 1, wherein the at least one high temperature superconducting resonator is formed using a yttrium-based material.
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4. The resonant circuit of claim 1, wherein the at least one high temperature superconducting resonator is formed using a bismuth-based material.
5. The tunable resonant circuit of claim 1, wherein the at least one high temperature superconducting resonator is formed with an epitaxial thin film
- 20 superconductor.
6. The resonant circuit of claim 1, wherein the substrate comprises a dielectric material.

7. The resonant circuit of claim 6, wherein the substrate is a wafer having a diameter of two inches or less.
- 5        8. The resonant circuit of claim 1 further including a tuning structure.